

## ABSTRACT

A method of catalytic reaction uses a micro-reactor (1) with a metal catalyst (5) or a metal complex catalyst (5) as a solid phase supported on the inner wall (4c) of a channel (4), a solution (7) dissolving a reactant as a liquid phase and hydrogen (9) as a gas phase are flown through the channel (4) in pipe flow state, and the reaction of the solution (7) and the gas (9) accelerated by the metal catalyst (5) or the metal complex catalyst (5) is conducted by three phase catalytic reaction of solid - liquid - gas phases. The metal catalyst (5) or the metal complex catalyst (5) is incorporated in a polymer, and hydrogenation reaction by three phase catalytic reductive reaction of a substance to be reduced can be conducted in short time at good yield. For hydrogenation reaction of unsaturated organics, the rate of reaction and yield are high when palladium catalyst is used, and carbonylation reaction can be conducted if carbon monoxide is used instead of hydrogen.